Infrastructure Australia
Australian Government

Regional Strengths and Infrastructure Gaps

Regional Analysis:
Indian Ocean Territories

Indian Ocean Territories

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Indian Ocean Territories

The Indian Ocean Territories (IOT), comprising of Christmas Island and the Cocos (Keeling) Islands, is located north-west of mainland Australia. These remote islands, close in proximity to Indonesia, have unique natural assets and are home to culturally diverse communities with large Cocos Malay, Malay and Chinese populations.

The economic drivers of Christmas Island and the Cocos (Keeling) Islands are distinct. Christmas Island's largest private sector employer is the phosphate mine which has a limited working life. Other economic activities include tourism and government services.[1] The Cocos (Keeling) Islands economy is heavily reliant on Commonwealth funded projects and activities. The region has tourism growth potential with national and marine parks and natural assets providing research, eco-tourism and adventure-tourism opportunities. The region also has potential to leverage its natural resources to grow its renewable energy capabilities and has conducted agri-business and horticultural trials to repurpose land for local food production.

As the region looks to the future, sound investments that enable sustainable community and industry prosperity are needed for the Territories to be 'business ready'. Affordable housing and accommodation is a constraint to growing the local workforce and tourism. Strengthened water, energy and food security as well as waste management are key to a sustainable future for the region. A snapshot of Strengths and Infrastructure Gaps is included below.

Strengths

Key existing assets

Economic	Gateway ports	Sea ports allow for the supply of essential goods to the region and ferry services whilst each island's airport provides crucial passenger and cargo access. There are plans to upgrade the runway on the Cocos (Keeling) Islands.
Natural	Natural environments	The region benefits from national parks and reefs which support unique ecosystems and enhance liveability for residents. This includes Christmas Island National Park, Christmas Island Marine Park, Cocos (Keeling) Islands Marine Park and Pulu Keeling National Park.
	Climate and topography	The region offers ideal climatic conditions for renewable energy generation, including solar, wind and tidal generation potential.
	Natural resources	Christmas Island holds phosphate reserves which have been a long-standing source of direct and indirect employment.
Social	Education and research institutions	As the only primary and secondary education facilities servicing the region, the Christmas and Cocos Island District High Schools serve as critical social infrastructure.

Key regional growth industries

Agriculture, forestry and fishing	Energy	Tourism
Through key research activities, agriculture and horticulture have been identified as promising opportunities to diversify the economy of Christmas Island and improve food security, with potential for using old mining sites to establish local agribusiness.[2,3]	Solar energy generation is a key opportunity to develop reliable and cost-effective methods of power and transition away from reliance on diesel energy.[4] There is significant potential to expand existing solar panels to larger scale systems with more capacity.[5] Additionally, the IOT has potential to develop a circular economy model.[6] IOT communities are seeking to have the majority of their energy requirements met via renewable sources by 2030.[7,8]	The IOT region presents potential for tourism growth. The region's natural environments and diverse wildlife bring many eco-tourism opportunities,[9] while its multicultural communities and proximity to South East Asian countries gives it an advantage in becoming a key destination of choice for Muslim tourists.[10]

Christmas Island

Infrastructure Gaps

Further analysis and engagement would support the identification of priority Infrastructure Gaps.

Broadband and mobile connectivity

The IOT region has unique and complex telecommunications challenges.[11] With the exception of the areas accessing fibre internet on Christmas Island, all communication in the region is via satellite. There are many constraints in the existing satellite networks including ongoing issues with speed, reliability, and quality of service, often caused by susceptibility to weather events and ageing backhaul equipment.

The mobile phone network at Christmas Island is 2G, with this service offering voice calls and text messages only. On the Cocos (Keeling) Islands there is no mobile phone network, with calls made and received using services over the 4G LTE data network. These services are less reliable and work differently to a mobile phone network and many users cannot receive calls or text messages to a mainland mobile phone number.

Water security (including wastewater management):

The delivery of water and sewage to the region has come under increasing pressure.[12] There is an identified need to review these services in relation to future increases in population, considering ageing infrastructure and capacity limitations. Proposed Seawater Reverse Osmosis plant and Wastewater Treatment Plant Upgrade Projects on the Cocos (Keeling) Islands seeks to improve water security and support economic development.[13]

Waste management and resource recovery

There are high costs for the removal of waste from the region, with an identified need for a waste strategy which focuses on waste avoidance, reduction, recycling, management and other initiatives.[14] The Shire of Cocos (Keeling) Islands has some recycling capability including crushing glass for use as road-base and the collection of aluminium for shipping to recycling facilities elsewhere. There is also recycling capability for plastic waste on Christmas Island. Eco Crab, an initiative on Christmas Island, undertakes a number of activities to combat plastic pollution challenges.[15] Waste management infrastructure, including recycling infrastructure, would provide for the continued sustainability of the region. Issues with the retrieval and removal of Asbestos Containing Material (ACM) is also an ongoing concern.

Distribution, transmission and generation of energy

The region has ideal climate conditions for renewable energy generation, with renewable energy seen as a key priority for local stakeholders.[16,17] The islands have plentiful clear days and high solar iridescence levels that provide the capability for high productivity solar energy generation. They also have the potential for tidal energy generation.[18] Preliminary research has identified that solar panels are a more cost-effective means of generating power on the island than the current diesel generators. If an appropriate mix of renewable energy assets is constructed, it could be possible to provide a more reliable and higher quality energy system for users and taxpayers.[19]

The Cocos (Keeling) Islands have already made advances in this area,[20] and Christmas Island is seeking to produce at least 60% of its energy from renewable sources by 2030.[21] The Indian Ocean Territories Power Service released a Request for Proposal for the supply of solar photovoltaic electricity on Christmas Island in 2022. The region also benefits from Australian Government support through the Indian Ocean Territories Power Service and the Renewable Energy Benefits Scheme, which aim to facilitate a transition to affordable renewable energy in the region.[22] A secure, reliable, affordable energy system is likely to require investment in transmission, distribution, storage and generation infrastructure, alongside policy reform to ensure that the region can handle the transition from diesel fuel reliance.[23,24] Installation and maintenance of renewable energy technologies, and distribution and transmission assets has significant potential in local job creation, both skilled and entry-level, whilst investigation into additional energy sources offers opportunities for research collaborations which may build the local knowledge base and improve relationships with tertiary institutions.[25]

Industry enabling infrastructure to support growth and innovation

The economy of Christmas Island has a traditional dependence on phosphate mining, and both Christmas Island and the Cocos (Keeling) Islands have a reliance on public sector employment. Other non-metallic mineral mining and quarrying and correctional and detention services were the main industries of employment on Christmas Island in 2016.[26] Local government administration and secondary education were the main industries of employment on the Cocos (Keeling) Islands in 2016.[27] Diversification of the region's economy is also crucial given the Christmas Island phosphate mine is expected to cease operation over the next decade.[28,29] Research collaborations are already underway in expanding agriculture on Christmas and Cocos (Keeling) Islands, including reusing exhausted mining land for food production.[30] Local initiatives to further develop in this area also provide potential in diversifying the region's economy and providing a secure, affordable supply of fresh food.[31]

Enabling infrastructure is needed to facilitate economic diversification in opportunities in tourism, renewable energy, agribusiness and the knowledge-sector.[32,33] Christmas Island stakeholders have noted benefits from an improved tourism offering, whilst Cocos (Keeling) Islands stakeholders identified the key markets of Muslim tourists and glamping.[34,35] As the region seeks to capitalise on visitor-based economic drivers the development of supporting infrastructure will be of increasing priority. Such infrastructure includes basic tourism amenities infrastructure, as well as adequate essential infrastructure to provide enough water, waste and power to support industry growth.

Availability, diversity and affordability of housing

Stakeholders identify ongoing housing shortages and barriers to affordable housing in the region, particularly on Cocos (Keeling) Islands. Christmas Island is also under housing pressure. Home ownership rates across the region are lower than the Australian average, with 16.1% of households on Cocos (Keeling) Islands[36] and 43.1% of households on Christmas Island[37] owned outright or with a mortgage in 2016. Challenges in obtaining finance for a mortgage is partly attributable to the difficulties in obtaining home insurance. The high cost of construction in the remote region is also a challenge. Housing and accommodation shortages have impacts on the workforce available for tourism and hospitality.

In partnership with the Australian Government, the Shire of Cocos (Keeling) Islands, on behalf of the Cocos Land Trust, is currently constructing two additional houses on Home Island. On West Island, long-term rentals are in very short supply, having a major impact on the workforce available for the tourism/hospitality industries. The Shire of Christmas Island is collecting local data on the housing market to help inform its upcoming Local Planning Strategy and new Town Planning Scheme.

Access to further education and skills training

Due to the remoteness of the region, skills and training pathways in the region are limited to the offerings of a small number of suppliers. Stakeholders note the need for any future investments in education in addressing the employment needs of future economic drivers in the IOT.[38]

Opportunities exist for the region to leverage its strategic location and diverse population to develop gateways for students looking to study in mainland Australia.[39] Existing and past research-based relationships between the region and tertiary institutions based on the mainland may provide opportunities for a diverse educational offering to locals, particularly in potential growth industries such as agriculture, horticulture, social sciences and sustainable living.

Access to and capacity of health and aged care infrastructure

The region has an ageing population and additional aged care infrastructure is needed to support the increased demands that this will place on primary care and home-based healthcare. Various needs are explored in the Indian Ocean Territories Health Service 5 Year Strategy.[40]

Capacity, connectivity and quality of public transport

Stakeholders note that ferry and bus services within the Cocos (Keeling) Islands could be improved to allow for more after-school activities, cultural celebrations/events and more late-night interaction.[41] Christmas Island does not have public transport, however some stakeholders note this as a need.[42] Cabotage restrictions also prevent flights on foreign airlines within the IOT, which may offer a feasible inter-island transport link.

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